Case Study:

Retro-Fit LED Pit Lighting for Arriva Trains Wales

HEADLINE ANNUAL SAVINGS ACHIEVED…

Energy: 377,469 kWh (a reduction of over 84%)
Financial: over £29,600-00
Co2: 207 tons

Taking into consideration all the costs of this project (the new LedLite gear-trays, the bespoke brackets and an installation cost of £50 per fitting) the payback period was only 26 months…and that's NOT including the additional savings which will be made by the substantial reduction in the on-going maintenance costs!

INTRODUCTION

We first called into Arriva's Canton depot in Cardiff to discuss energy efficient options to replace the ageing metal-halide high bays in their maintenance and carriage sheds. Whilst there the conversation turned to the concerns they had about the light fittings within their inspection pits, the high amount of energy they were consuming and the increasing level of maintenance and replacement they were requiring.

OPTIONS

Arriva were aware that the developments in LED technology probably meant that there would now be a more energy efficient and reliable way to provide the lighting they required. However, as any new fittings would need to be durable and able to resist cleaning with pressure washers their assumption was that the cost of replacing each of their existing recessed metal and glass fittings would be prohibitively expensive.

The solution that we developed was to design an LED gear-tray to retro-fit within their existing recessed carcasses, replacing the fluorescent tubes and control gear and removing the need to replace the whole fitting…substantially reducing the material cost of the project and the time and upheaval (and therefore cost) of the installation.

FEATURES

Adopting this bespoke approach allowed us to start with the clients' requirements and then 'design-in' the technologies needed to achieve them. Using our LedLite linear technology would allow us to reduce the energy consumption of each fitting from approximately 145w to about 45w, meaning a reduction of some 69%.

We felt that additional energy savings could be made by not unnecessarily lighting sections of the pits that were unoccupied, as was the case at present, so we added a microwave occupancy sensor to each gear-tray to automatically turn the gear-tray on when the immediate vicinity became occupied and turn it off again once the area had been vacated. However, further conversations with the client revealed concerns that leaving a pit in complete darkness could be a potential hazard, especially in the depots at night.

We therefore re-designed the new gear-tray with two separate circuits of LED diodes, each with its' own driver, with one circuit providing the main lighting and the other providing a low-energy 'background' light. This means that each fitting provides full illumination when an engineer is working nearby in the pit but when no-one's in the area it will sit in its' low-energy 'background' lighting mode, providing some illumination to the pit but only consuming about 5 watts. This solution gave us a combination of energy savings and safety that appealed to Arriva Trains Wales.

TRIALS

It was agreed to trial this technology in one of the pits so that Arriva could get some feedback from their engineers on working alongside the new lighting. As the integral microwave sensor has a range of different setting options to control the sensitivity and the time-out periods this also gave us the opportunity to try a few different combinations to find what worked best for this situation.

The reaction of the engineers was overwhelmingly positive and so the decision to install our retro-fit solution throughout the depot was taken.

INSTALLATION

The installation was carried-out by Arriva's approved electrical contractor using the bespoke mounting bracket that we designed to secure the new gear-trays to both types of existing carcasses, making the installation process as quick and easy as possible.

CALCULATED SAVINGS

In total 318 of our retro-fit LedLite gear-trays were installed on this project, 51 of which also supplied the required emergency lighting. The original T8 fluorescent lighting had an annual energy consumption of 446,549.76 kWh at a cost to Arriva of £34,880. Equipped with our LedLite gear-trays these fittings now have an estimated annual consumption of just 69,080.63 kWh, costing £5,277.

Please see the images on the following pages showing the stages of the installation process…

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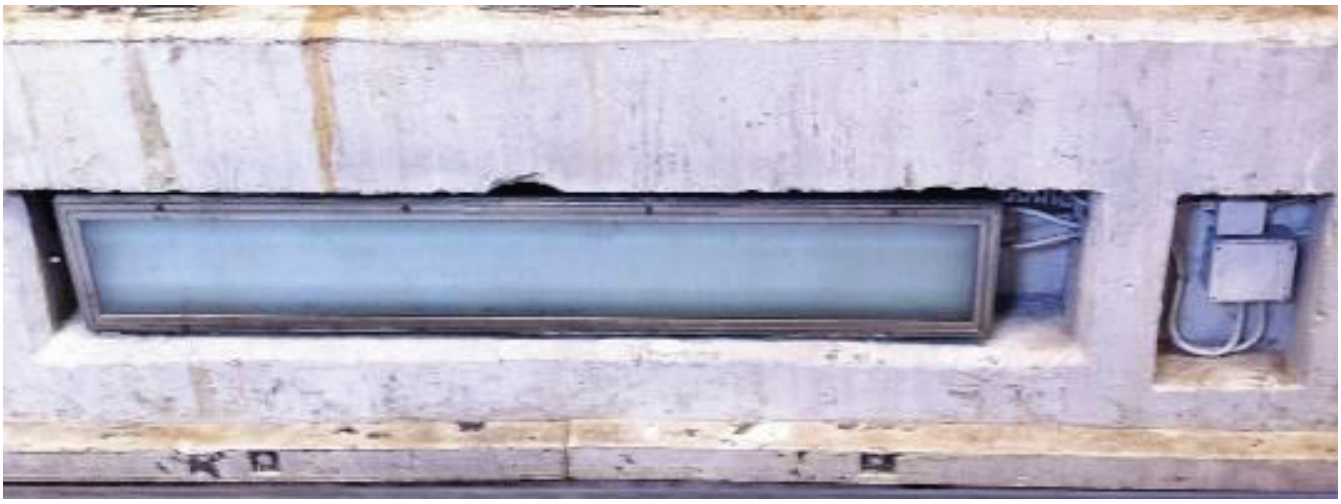

1. The existing fitting in the pit wall equipped with twin T8 fluorescent lamps

2. Remove the diffuser and the existing reflector plate and ballast

3. The existing bracket (one of two different types found on this installation)

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4. Attach the bespoke bracket to the existing carcass (just 2 fixings)

5. Attach the Morgan Hope LED gear-tray to the bespoke bracket (just 2 fixings)

6. Replace the original diffuser above the new LED light source